Key Skill	Year 6	Year 7	Year 8
Number: Place Value	▪ read, write, order and compare numbers up to 10 000 000 and determine the value of each digit ▪ round any whole number to a required degree of accuracy ▪ use negative numbers in context, and calculate intervals across zero ▪ solve number and practical problems that involve all of the above pupils use the whole number system, including saying, reading and writing numbers accurately	▪ use place value, including for decimals, measures and for any size of integers, the language of larger and smaller numbers, and ordering numbers, including the correct use of =, ≠, <, >, ≤, ≥ ▪ understand and use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals ▪ Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative estimate number, measures, and approximate answers, including using these to check other calculation methods	Understand and use place value for decimals, measures and integers of any size (Covered in year 7)
Number: Addition & Subtraction	• Use their knowledge of the order of operations to carry out calculations involving the four operations to solve addition and subtraction in multi-step problems in contexts. Deciding which operations and methods to use and why • perform mental calculations including	• Recognise and use relationships between operations including inverse operations • use the four operations, including formal written methods applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative	• Covered in Year 7

	with mixed operations and large numbers		
Number: Multiplication & Division	▪ multiply multi- digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication ▪ divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context ▪ divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context Use their knowledge of the order of operations to carry out calculations involving the four operations to solve problems involving multiplication and division. ▪ Identify common factors, common multiples, and prime numbers	1. know and use prime numbers, common factor and common multiples for whole numbers with two and three digits 2. recognise and use relationships between operations including inverse operations 3. use the four operations, including formal written methods applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative • understand and use conventional notation for the priority of operations, including brackets, powers, roots and reciprocals	• Covered in year 7 with the addition of prime numbers, factors (or divisors), multiples, common factors, common multiples, HCF, LCM, prime factorisation, including using product notation and unique factorisation property
Number: Fractions (including Decimals & Percentages)	▪ divide proper fractions by whole numbers (for example, 1/3 ÷ 2 = 1/6) ▪ associate a fraction with division and calculate decimal fraction equivalents (for example, 0.375) for a simple fraction (for example, 3/8) ▪ multiply one- digit numbers with up to two decimal places by whole numbers	▪ compare, order and convert between fractions and decimals ▪ interpret percentages and percentage change as a fraction or a decimal ▪ find fractions and percentages of an amount ▪ solve problems with fractions greater than 1 4. explore over 100%	5. Order positive and negative integers, decimals and fractions; use the number line as a model for ordering real numbers; use symbols = ,≠,≤, ≥ ,< and > Adding and subtracting fractions Multiplying fractions and Integers, dividing with integers and fractions

	▪ use written division methods in cases where the answer has to two decimal places ▪ recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.		Multiplication and division with larger and small numbers Define percentage as number of parts per hundred, interpret percentages and percentage changes as a fraction or a decimal, express one quantity as a percentage of another, compare two quantities using percentages, and work with percentages greater than 100% • Interpret fractions and percentages as operators • Use standard units of mass, length, time, money and other measures, including with decimal quantities (covered in Year7)

Ration and proportion	▪ solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison ▪ solve problems involving similar shapes where the scale factor is known or can be found ▪ solve problems involving unequal sharing and grouping using knowledge of fractions ▪ solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication and division facts	▪ change freely between related standard units [for example time, length, area, volume/capacity, mass] ▪ use scale factors, scale diagrams and maps ▪ express one quantity as a fraction of another, where the fraction is less than 1 and greater than 1 use ratio notation, including reduction to simplest form ▪ divide a given quantity into two parts in a given part: part or part: whole ratio; express the division of a quantity into two parts as a ratio ▪ understand that a multiplicative relationship between two quantities can be expressed as a ratio or a fraction ▪ relate the language of ratios and the	▪ • Covered in year 7 with the addition of scale factors, scale diagrams and maps ▪ Use ratio notation including reduction to simplest form ▪ Understand that multiplicative relationship between two quantities can be expressed as a ratio or fraction ▪ Solve problems involving direct and inverse proportion, including graphical and algebraic representations ▪ Covered in year 7 with the addition of scale factors, scale diagrams and maps • Use ratio notation including reduction to simplest form • Understand that multiplicative relationship between two quantities can be expressed as a ratio or fraction • Solve problems involving direct and inverse proportion, including graphical and algebraic representations

		associated calculations to the arithmetic of fractions and to linear functions ▪ solve problems involving percentage change, including: percentage increase, decrease and original value problems and simple interest in financial mathematics ▪ solve problems involving direct and inverse proportion, including graphical and algebraic representations ▪ use compound units such as speed, unit pricing and density to solve problems.	

Algebra	▪ use simple formulae ▪ generate and describe linear number sequences ▪ express missing number problems algebraically ▪ find pairs of numbers that satisfy an equation with two unknowns ▪ enumerate possibilities of combinations of two variables	▪ substitute numerical values into formulae and expressions, including scientific formulae ▪ understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors ▪ simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of two or more binomials ▪ understand and use standard mathematical formulae; rearrange formulae to change the subject ▪ model situations or procedures by translating them into algebraic expressions or formulae and by using graphs ▪ use algebraic methods to solve linear equations in one variable (including all forms that	▪ use and interpret algebraic notation, including: ab in place of a × b, 3y in place of y + y + y and 3 × y, a2 in place of a × a, a3 in place of a × a × a; a2 b in place of a × a × b, b a in place of a ÷ b, coefficients written as fractions rather ▪ than as decimals, brackets substitute numerical values into formulae and expressions, including scientific formulae ▪ understand and use the concepts and vocabulary of expressions, equations, inequalities, terms and factors ▪ simplify and manipulate algebraic expressions to maintain equivalence by: collecting like terms, multiplying a single term over a bracket, taking out common factors, expanding products of two or more binomials ▪ understand and use standard mathematical formulae; rearrange formulae to

		require rearrangement) ▪ work with coordinates in all four quadrants ▪recognise, sketch and produce graphs of linear and quadratic functions of one variable with appropriate scaling, using equations in x and y and the Cartesian plane ▪ interpret mathematical relationships both algebraically and graphically	change the subject ▪ model situations or procedures by translating them ▪ into algebraic

Measurement and Geometry	▪ solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate ▪ use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places ▪ convert between miles and kilometres ▪ recognise that shapes with the same areas can have different perimeters and vice versa ▪ recognise when it is possible to use formulae for area and volume of shapes ▪ calculate the area of parallelograms and triangles ▪ calculate, estimate and Compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units (f or example, mm^3 and km^3) draw 2-D shapes using given dimensions and angles recognise, describe and build simple 3-D shapes, including making nets compare and classify geometric shapes based on their properties and sizes and find unknown	▪ use mass, length, time, money and other measures, including with decimal quantities solve problems involving perimeter and area of triangles parallelograms, triangles and trapeziums and composite shapes; surface area and volumes of cubes and cuboids ▪ convert metric units solve perimeter and area problems	Derive and apply formulae to calculate and solve problems involving: perimeter and area or triangles and parallelograms, trapezia, volume of cubes and cuboids (including cubes) and other prisms (including cylinders) Calculate and solve problems involving: perimeters of 2D shapes (including circles), area of circles and composite shapes Derive and use the standard ruler and compass constructions (perpendicular bisector of a line, segment, constructing a perpendicular to a given line from/ at a given point, bisecting a given angle); recognise and use the perpendicular distance from a point to a line as the shortest distance to the line Describe, sketch and draw using conventional terms and notations: points, lines, right angles, regular polygons and other polygons that reflectively and rotational symmetry. Use the standard conventions for labelling the sides and angles of triangles ABC, and know and use the criteria for congruence of triangles Derive and illustrate properties of triangles, quadrilaterals, circles, and other plane figures Identify properties and describe results of translations, rotations and reflections applied to given figures

	angles in any triangles, quadrilaterals, and regular polygons illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.		Identify and construct congruent triangles, and construct similar shapes by enlargement with and without coordinates Apply the properties of angles at a point, angles on a straight line and vertically opposite angles Understand the relationship between parallel lines and alternate angles Use the properties and faces, surfaces, edges and vertices of cubes, cuboids, prisms cylinders, pyramids, cones and spheres to solve problems in 3D Interpret mathematical relationships both algebraically and geometrically

Probability	▪ Covered in year 7	record and describe the outcomes of simple probability experiments involving fairness, equally and unequally likely outcomes using appropriate language and the 0-1 scale	Covered in year 7 with the addition of enumerate sets and unions/ intersections of sets systematically, using tables, grids and Venn diagrams Generate theoretical sample spaces for single and combined events with equally likely, mutually exclusive outcomes and use these to calculate theoretical probabilities

Statistics	interpret and construct pie charts and line graphs and use these to solve problems calculate and interpret the mean as an average.	describe simple mathematical relationships between two variables in observational and experimental contexts identify appropriate questions, data collection, presentation and interpretation to conduct exploratory data analysis	• As year 7 with the addition of :- • Describe interpret and compare observed distributions of a single variable through: appropriate graphical representation involving discrete, continuous and grouped data; and appropriate measures of mean, mode, median and range • Construct and interpret appropriate tables, charts and diagrams including frequency tables, bar charts, pie charts and pictograms for categorical data, and vertical line (or bar) charts for ungrouped and grouped numerical data